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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,249	10/25/2001	Thomas A. Sexton	873.0101.U1(US)	2115

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EXAMINER	
MERED, HABTE	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/004,249	SEXTON ET AL.	
	Examiner	Art Unit	
	Habte Mered	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 02 May 2006 has been entered and fully considered.

2. Claims 1-20 are pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1,2, 4-8, and 10-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourlas et al (US Pub. No. 2002/0119783), hereinafter referred to as Bourlas, in view of Kondo (US 5, 748, 624) and Demjanenko et al (US Pub. No. 2002/0051501), hereinafter referred to as Demjanenko.

Bourlas discloses an adaptive call admission control for use in a wireless communication system.

5. Regarding **claims 1, 14, and 18**, Bourlas discloses a method for granting system access to mobile stations, comprising: receiving a call admission request from a mobile station at the edge of a cell **(See Paragraphs 8, 9, 27 and 28; In Bourlas' system the base station receives call admission requests from any mobile in the cell it serves including mobiles located at the edge of the cell.)**; and granting system resources to the mobile station based at least in part on a bandwidth requirement of the mobile station, wherein for a mobile station having a high bandwidth requirement, the mobile station is preferentially granted system resources, *as compared to another mobile*

station having a lower bandwidth requirement **(In Paragraphs 39 and 40 Bourlas teaches that a mobile seeking a T1-type continuous data services is granted more bandwidth as opposed to a mobile seeking a TCP/IP bursty data services provided the bandwidth availability in the system and other parameters allow such a preferential allocation.)**, by being assigned a plurality of time slots per frame for forming one radio information block **(See Paragraphs 9, 30-33, 39, 45, 80-82 and Figures 2 and 4)**.

6. Regarding **claim 7**, Bourlas discloses a cellular communications system, comprising: a plurality of mobile stations located within at least one cell (See Figure 1, elements 104); a base transceiver station (BTS) for servicing the cell (See Figure 1, element 102); a base station controller (BSC) coupled to the BTS **(It is inherent for a base station 102 in Figure 1 deploying TDMA/TDD to be coupled to a Base station Controller in cellular systems such as GSM)**; and a Call Admission processor coupled to the BTS for receiving a call admission request from mobile stations located in the cell served by the BTS **(Figure 3, element 206 is a Call Admission Control Module)** shows, the processor granting cellular communications system resources to the mobile stations based at least in part on level of service required by the mobile Stations **(See Paragraphs 43-45)** and on a location of the mobile stations within the cell, wherein for a mobile station having a high bandwidth requirement that is determined to be located at the edge of the cell **(See Paragraphs 26-28)**, the mobile station is preferentially granted system resources by being assigned a plurality of time

slots per frame for forming one radio information block **(See Paragraphs 9, 30-33, 39, 45, 80-82 and Figure 4)**.

7. With respect to **claims 1, 7, 14, and 18**, Bourlas teaches that a new connection request with high quality of service requiring higher bandwidth is granted more system resources such as the portion of the frame that is allocated for the uplink and downlink **(see Paragraph 43)** and uses a precedence module to determine and guarantee if more resources can be made available to the new connection requesting higher bandwidth. **(See Paragraphs 61-64)** Bourlas however fails to expressly disclose a method where a mobile station, with a higher bandwidth requirement, requesting call admission is assigned a plurality of time slots per frame while a mobile station, with a lower bandwidth requirement, requesting call admission is assigned a single time slot.

Kondo teaches an efficient method of time slot allocation for a communication in a TDMA communication system, which allocates one or more time slots in a TDMA frame.

Kondo discloses a method where a mobile station, with a higher bandwidth requirement, requesting call admission is assigned a plurality of time slots per frame while a mobile station, with a lower bandwidth requirement, requesting call admission is assigned a single time slot. **(See Column 3:34-55 and Column 6:25-45 and See Figure 5, steps 510 and 512)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' method to incorporate a method where a mobile station, with a higher bandwidth requirement, requesting call admission is assigned a

plurality of time slots per frame while a mobile station, with a lower bandwidth requirement, requesting call admission is assigned a single time slot. The motivation being mobile stations requiring higher bandwidth have higher transmission speed and need more time slots to transfer data in order to meet the quality service associated with the mobile stations as stated in Kondo in Column 1:58-64

8. With respect to **claims 1, 7, 14, and 18**, Bourlas teaches that various schemes of quadrature amplitude modulation (QAM) can be used but fails to expressively disclose the modulation schemes are operated with a coding technique that employs an iterative decoding technique.

Demjanenko discloses a technique for coding and decoding signals used in data transmission over wired and wireless systems that use Turbo Codes.

Demjanenko teaches a system that is operated with a coding technique that employs an iterative decoding technique. **(See Paragraph 681; Demjanenko teaches the received signal is demodulated and a decoded bit stream is produced by iteratively decoding the demodulated signal.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' method to incorporate iterative decoding technique, the motivation being to ensure that the extra coding gained by Turbo Codes is realized.

9. Regarding **claims 2 and 8,** Bourlas teaches all aspects of the claimed invention as set forth in the rejection of claims 1 and 7 but fails to teach a method, wherein the

mobile station is operated at a rate 3/4 16-QAM mobile station at a throughput of approximately K x 59.2 kbps, where K is the number of occupied time slots in the frame.

Demjanenko teaches that a mobile station is operated at a rate 3/4 16-QAM mobile station at a throughput of approximately K x 59.2 kbps, where K is the number of occupied time slots in the frame. **(See Figures 19 and 61. See Paragraphs 289-304; Further Demjanenko discloses that in his system a maximum throughput of 6, 144 kbits can be achieved by far exceeding the Applicant's apparatus throughput. Data throughput is a function of SNR and channel characteristics (Gaussian or Raleigh) and the expected BER further constraints the system.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' apparatus to incorporate operating mobiles at a rate ¾ 16-QAM, the motivation being to use turbo codes that outperform all previously known coding schemes regardless of the targeted channel where the extra coding gain offered by these codes can be used to save bandwidth or reduce power requirements in the link budget.

10. Regarding **claims 4 and 10,** Bourlas teaches all aspects of the claimed invention as set forth in the rejection of claims 1 and 7 but fails to teach a method, wherein the mobile station is operated at a rate 5/6 64-QAM mobile station at a throughput of approximately K x 98.667 Kbps kbps, where K is the number of occupied time slots in the frame.

Demjanenko teaches that a mobile station is operated at a rate 5/6 64-QAM mobile station at a throughput of approximately K x 98.667 kbps, where K is the number

of occupied time slots in the frame. **(See Figure 46. See Paragraphs 426-443; Further Demjanenko discloses that in his system a maximum throughput of 6, 144 kbits can be achieved by far exceeding the Applicant's apparatus throughput. Data throughput is a function of SNR and channel characteristics (Gaussian or Raleigh) and the expected BER further constraints the system.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' apparatus to incorporate operating mobiles at a rate 5/6 64-QAM, the motivation being to use turbo codes that outperform all previously known coding schemes regardless of the targeted channel where the extra coding gain offered by these codes can be used to save bandwidth or reduce power requirements in the link budget.

11. Regarding **claims 5, 11, and 15**, Bourlas teaches all aspects of the claimed invention as set forth in the rejection of claims 1, 7, and 14 but fails to teach a method wherein the modulation format is selected from one of GMSK, 8-PSK, rectangular 16 gray coded QAM, 64 gray coded QAM, and 32 cross-QAM.

Demjanenko teaches a method wherein the modulation format is selected from one of GMSK, 8-PSK, rectangular 16 gray coded QAM, 64 gray-coded QAM, and 32 cross-QAM. **(See Paragraphs 2, 146, 349 and Figure 46)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' apparatus to incorporate the ability to select modulation format as discussed above, the motivation being to ensure that the extra coding gained by Turbo Codes is realized.

12. Regarding **claims 6, 12, and 16**, Bourlas discloses a method wherein the radio information block comprises four TDMA frames and occupies K slots per TDMA frame, wherein the radio information block size is equal to N=464.times.K.times.throughput bits, where the throughput is equal to the number of information bits per data symbol. **(Bourlas teaches that variable number of slots can be assigned to a user terminal. See Paragraphs 9, 30-33, 39, 45, 80-82 and Figure 4. Data throughput is a function of SNR and channel characteristics (Gaussian or Raleigh) and the expected BER further constraints the system.)**

13. Regarding **claims 13 and 17**, Bourlas teaches all aspects of the claimed invention as set forth in the rejection of claims 7 and 14 but fails to teach wherein the iterative coding technique comprises a turbo code, the turbo code being implemented with two n-state identical recursive systematic convolutional encoders (13_8,15_8) that are combined in parallel through a pseudo-random bit interleaver.

Demjanenko teaches a method wherein the iterative coding technique comprises a turbo code, the turbo code being implemented with two n-state identical recursive systematic convolutional encoders that are combined in parallel through a pseudo-random bit interleaver. **(See Figure 76 and Paragraph 667)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' apparatus to incorporate iterative decoding technique comprising turbo code, the motivation being to ensure that the extra coding gained by Turbo Codes is realized.

14. Regarding **claim 19**, Bourlas discloses a method, wherein the mobile station is located at the cell edge, and further comprising adjusting the granted system resources as the mobile station changes its location within the cell **(See Paragraphs 26-28)**, and retaining the granted system resources as the mobile station transitions to an edge of another cell. **(See Paragraphs 43-45. Bourlas also discloses any call admission request irrespective of the mobile's location will be honored as long as there is enough bandwidth to allocate for the call. See also figure 4)**

15. Regarding **claim 20**, Bourlas teaches all aspects of the claimed invention as set forth in the rejection of claim 18 but fails to teach a method wherein the iterative decoding technique uses a turbo code.

Demjanenko teaches a method wherein the iterative decoding technique uses a turbo code. **(See Paragraphs 664, 667, 674, and 681. Demjanenko discloses a turbo decoder that uses iterative decoding technique.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Bourlas' apparatus to incorporate iterative decoding technique that uses turbo code, the motivation being to ensure that the extra coding gained by Turbo Codes is realized.

16. **Claims 3 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourlas in view of Kondo and Demjanenko as applied to claims 1 and 7 above, and further in view of Raghavan et al (US Pub. No. 2003/0134607), hereinafter referred to as Raghavan.

The combination of Bourlas, Kondo and Demjanenko, teaches all aspects of the claimed invention as set forth in the rejections of claims 1 and 7 but does not disclose a method, wherein the mobile station is operated as a rate 4/5 32-QAM mobile station at a throughput of approximately K.times.78.93 kbps, where K is the number of occupied time slots in the frame.

Raghavan teaches a multi-channel communications transceiver that uses any combination of modulation systems such as PAM and QAM.

Raghavan discloses a method, wherein the mobile station is operated as a rate 4/5 32-QAM mobile station at a throughput of approximately K.times.78.93 kbps, where K is the number of occupied time slots in the frame. **(See Paragraphs 24, 83, 85, and 114. Data throughput is a function of SNR and channel characteristics (Gaussian or Raleigh) and the expected BER further constraints the system.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Bourlas' and Demjanenko's apparatus to incorporate operating mobiles at a rate 4/5 32-QAM, the motivation being to use turbo codes that outperform all previously known coding schemes regardless of the targeted channel where the extra coding gain offered by these codes can be used to save bandwidth or reduce power requirements in the link budget.

Response to Arguments

17. Applicant's arguments filed on 02 May 2006 have been fully considered but they are not persuasive.

18. In the Remarks, on Page 8, in lines 16-17, Applicant indicates Paragraphs 30-33 do no deal with granting of system resources and are not pertinent to the discussion of independent claims 1, 14, and 18. Examiner respectfully disagrees. For instance paragraph 33 shows how time slots can be assigned to different mobiles as further illustrated in Figure 2 and time slot is a system resource that is granted by the base station.

19. In the Remarks on Page 10, in lines 15-16, Applicant argues Bourlas does not teach preferentially granting system resources to a mobile station requesting call admission to another mobile station requesting call admission as claimed in claims 1, 14, and 18. Examiner respectfully disagrees.

In paragraph 39 Bourlas teaches the mobiles request bandwidth allocation from the base station and the base station allocates bandwidth based on the user's defined quality of service, bandwidth needs and transmission quality. This means if user A is subscribing to broadband services then it needs higher bandwidth and will be assigned more bandwidth than say user B subscribing to a service requiring lower bandwidth. Certainly user A's needs have a higher precedence over user B's needs if user A is subscribing to a premium service guaranteeing a certain level of bandwidth as long as user A pays for the premium services. Bourlas further clearly establishes in paragraph 40 a mobile seeking a T1-type continuous data services is granted more bandwidth as opposed to a mobile seeking a TCP/IP bursty data services provided the bandwidth availability in the system and other parameters allow such a preferential allocation.

20. Finally it is the position of the Examiner that Bourlas teaches for any mobile requesting higher bandwidth, irrespective of its location and as long as the system capacity allows it, the base station will assign it more system resources such as time slot as opposed to a mobile requesting lower bandwidth service. As indicated in the rejection Bourlas does not expressly disclose a mobile with lower bandwidth request gets single time slot as implied in claims 1, 14, and 18. In other words, Bourlas teaches preferentially granting system resources but does not quantify it by indicating lower bandwidth requests are assigned a single time slot. However Kondo remedies Bourlas deficiency and clearly teaches always a mobile with a lower bandwidth request is assigned a single time slot.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following US Patents are cited to show the state of the art with respect to high-speed data transmission in a digital mobile communication system using multi-slot mobiles:

US Patent (6, 016, 311) to Gilbert et al

US Patent (6, 148, 209) to Hamalainen et al

The following US Patent Application Publications are cited to show the state of the art with respect to modulation techniques used in wireless communications:

US Pub. No. (2005/0002468) to Walton et al

US Pub. No. (2005/0053030) to Zehavi

US Pub. No. (2005/0097424) to Golitschek et al

US Pub. No. (2002/0131524) to Demjanenko et al

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
10-13-2006

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